

Application S/N 10/522,858  
 Amendment dated 02/28/2006  
 Reply to Office Action of 01/06/2006

## AMENDMENTS TO THE CLAIMS

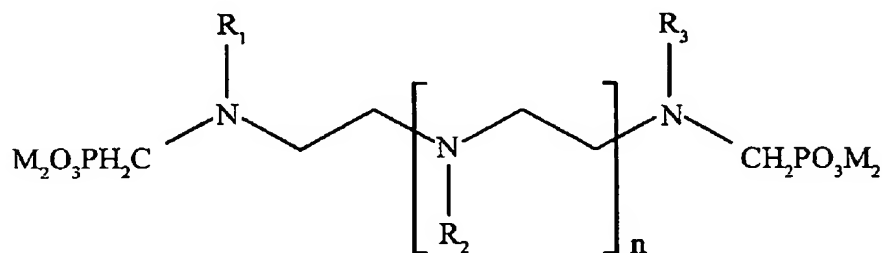
This listing will replace all prior versions and listings of claims, in the application.

### Listing of Claims:

What is claimed is:

1. (canceled)

2. (currently amended) A scale inhibitor comprising at least one polymethylenephosphate derivative having the following formula:



wherein n is ~~a number~~ an integer comprised between 2 and 15000,

wherein M is a hydrogen or a cation,

wherein R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are each independently selected from the group consisting of,

CH<sub>2</sub>PO<sub>3</sub>M<sub>2</sub>,

CH<sub>2</sub>R<sub>4</sub>, wherein R<sub>4</sub> is CHOHCH<sub>3</sub>, CHOHCH<sub>2</sub>Cl, or CHOHCH<sub>2</sub>OH,

(CH<sub>2</sub>)<sub>m</sub>SO<sub>3</sub>M, wherein m is 3 or 4, and

CH<sub>2</sub>CH<sub>2</sub>R<sub>5</sub>, wherein R<sub>5</sub> is CONH<sub>2</sub>, CHO, COOR<sub>6</sub>, COOX, or CN, wherein R<sub>6</sub> is CH<sub>3</sub> or C<sub>2</sub>H<sub>5</sub>, and wherein X is an alkali metal or ammonium, and

wherein at least one of R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> is not CH<sub>2</sub>PO<sub>3</sub>M<sub>2</sub>.

Application S/N 10/522,858  
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3. (previously presented) The scale inhibitor according to claim 2, wherein at least one of the  $\text{CH}_2\text{PO}_3\text{M}_2$  moieties in a terminal position on the molecule is replaced by a moiety selected from the group consisting of  $\text{CH}_2\text{R}_4$ ,  $(\text{CH}_2)_m\text{SO}_3\text{M}$ , and  $\text{CH}_2\text{CH}_2\text{R}_5$ .

4. (previously presented) The scale inhibitor of claim 2, wherein the polyaminomethylenephosphonate derivative is produced by a process of phosphonomethylation of polyamine derivatives employing the Mannich reaction.

5. (canceled)

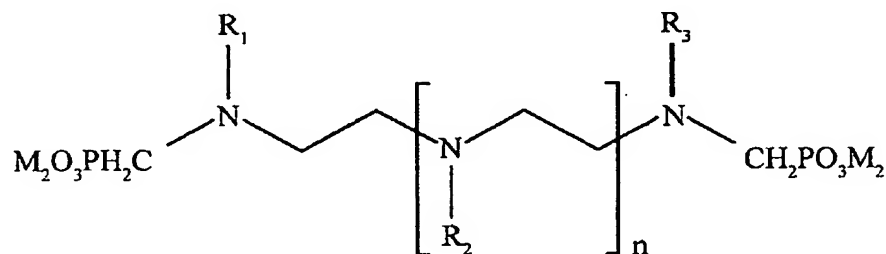
6. (canceled)

7. (canceled)

8. (canceled)

9. (currently amended): The precipitation inhibitor according to claim 2, wherein ~~the cation~~ M is an alkali metal or ammonium.

10. (currently amended): A method for inhibiting scale formation in water, the method comprising the step of adding to the water a scale inhibitor comprising at least one polymethylenephosphonate derivative having the following formula:

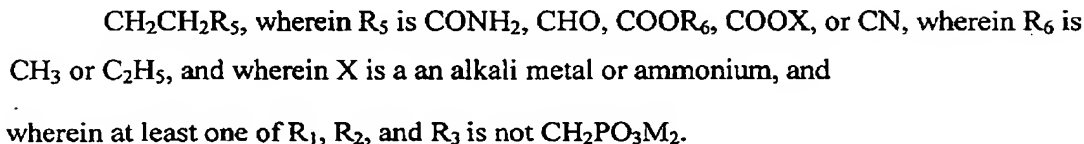
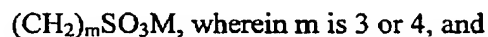
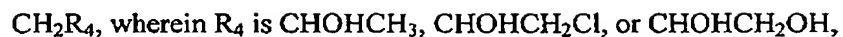


wherein n is ~~a number~~ an integer comprised between 2 and 15000,

wherein M is hydrogen or a cation,

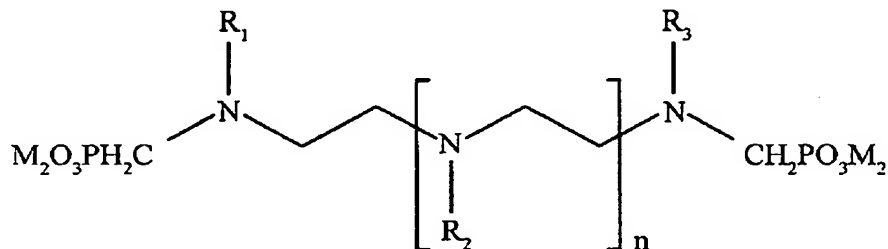
wherein  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  are each independently selected from the group consisting of,

Application S/N 10/522,858  
 Amendment dated 02/28/2006  
 Reply to Office Action of 01/06/2006



11. (previously presented): The method according to claim 10, further comprising the step of precipitating the polymethylenephosphonate derivative on a metal surface in contact with the water, thereby preventing corrosion of the metal surface.

12. (currently amended): A method for sequestering iron ions in a water system, the method comprising the step of providing the water in the water system with a scale inhibitor comprising at least one polymethylenephosphonate derivative having the following formula:



wherein  $n$  is ~~a number~~ an integer comprised between 2 and 15000,

wherein  $\text{M}$  is hydrogen or a cation,

wherein  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  are each independently selected from the group consisting of,



Application S/N 10/522,858  
Amendment dated 02/28/2006  
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$\text{CH}_2\text{CH}_2\text{R}_5$ , wherein  $\text{R}_5$  is  $\text{CONH}_2$ ,  $\text{CHO}$ ,  $\text{COOR}_6$ ,  $\text{COOX}$ , or  $\text{CN}$ , wherein  $\text{R}_6$  is  $\text{CH}_3$  or  $\text{C}_2\text{H}_5$ , and wherein  $\text{X}$  is an alkali metal or ammonium, and wherein at least one of  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  is not  $\text{CH}_2\text{PO}_3\text{M}_2$ .